REMARKS

This amendment is responsive to the Office Action dated January 3, 2005. Claims 2 - 6 and 8 - 16 are pending in this application and have been rejected. Reexamination is respectfully requested in light of the foregoing amendments.

Applicant has noted that in this rejection the Examiner has assumed that all of the art comes from a detection art for colonies of microorganisms. Applicant before discussing rejections of individual claims, requests the Examiner to consider the following discussion of all references when considered as a whole.

King '396

King is a detector for detecting fluorescence, not a detector for detecting an illumination. Fluorescence is a secondary illumination from the object after it has been illuminated with light, not an image obtained by blocking of light. King, as a fluorescence detector, teaches directly away from any combination with references which are for colony detection. Specifically, King at column 1, lines 20 - 33 teaches that cultures from 48 to 72 hours are to be avoided and that reliance upon such cultures is not in accordance with his invention which seeks to avoid this problem in the prior art.

King also teaches that his camera senses the emission frequency of a specified fluorochrome from a stained sample (column 3, lines 5 - 15).

Drocourt '394

Drocourt, like King, if a fluorescence detecting apparatus. Like King, Drocourt teaches away from apparatus which measures according to a traditional technique which requires culture growth, or colonies (see '394, column 1, lines 25 - 35). '394 teaches that there is a critical need for more rapid, more sensitive and automated methods than the cultured colonies (column 1, lines 34 - 36). '394 further teaches that fluorescence detection in a microscope is superior to colony counting (column 1, lines 44 - 54). In '394, it is the fluorescence that is detected, not a projection of an image of the item detected.

Hirschfeld '270

Hirschfeld teaches a flowing cylinder as explained at column 6, lines 10 - 15. However, Hirschfeld is also from a single cell nucleus technology which is different from either colonies or fluorescence detection (see column 9, lines 25 - 30).

Brocklehurst '003

Brocklehurst '003 teaches detection of colonies. However, Brocklehurst '003 teaches away from bioluminescence

(fluorescence) in column 1, lines 10 - 15, and teaches away from flow cells in column 1, lines 45 - 50. '003 is totally different from Applicant's claimed invention because there is no projected image data obtained by the image sensor. Instead, as shown in Figure 2 of '003, a laser (8) is further constricted by a pinhole (9) which puts a narrow beam on a cassette held by a holding cassette (5). Light is deflected at 90° (scattered light), focused by a microscope objective (10), scanned by a mirror (11), and then further passed through a pinhole (12) prior to detection by a photomultiplier (14). In this arrangement, there is no projected image data, but instead scattered light from the colony which is detected. The projected image data (light passing straight through) is received by a beam stop (15) as shown in Figure 2. As compared to Applicant's Figure 1, Applicant teaches passing the light directly through the loading portion or cell area (5) to a sensor (4) in order to create the claimed projected image data.

Olsztyn '789

Olsztyn is from the colony counter art like Brocklehurst '003. '789 utilizes a line scan operation with a linear motor (column 1, lines 15 - 20). '789 has been cited as an example of rotation of the dish during measurement. However, the citation given by the Examiner (column 6, lines 31 - 41) relates to rotation while the bacteria specimen is dropped onto the dish, not rotation during observation. This reference includes no

laser, and does not have a cylinder. Instead, it is a line scan of a dish with specimens on the top of the dish with non-laser light passing up from the bottom of the dish.

Tanaka '819

Tanaka is a typical well-known beam expander, but there is no suggestion that a beam expander should be used as does Applicant in Figure 1 in order to broaden the beam of a laser in order to produce a projected image to be projected on a culture colony.

The Rejection of Claims 2, 11 - 13 and 15

This group of claims has been rejected as being unpatentable over King '396 in view of Brocklehurst '003. Initially, the Examiner should note that as pointed out above, King is a fluorescence detection system and Brocklehurst is for colonies. Nowhere in King is there discussion of colony detection. It is always fluorescence detection by means of fluorescent light. In King, the fluorescence is a fluorescence produced by initially irradiating the fluorescent material with a light, and then detecting the fluorescence emitted thereby. As taught by King, fluorescence is superior to culture technology (King, column 1, lines 20 - 33). Therefore, there is no teaching or suggestion to combine these two references, but, in fact, a direct teaching away from the combination as found in '396.

'396 most clearly differentiates from Applicant's claimed invention at column 5, lines 25 - 35, where it states that a basic principle of the apparatus is to measure microorganisms in a way such that the means for discriminating between foreign matter and fluorescent-stain microbe is accomplished by an expert-trained system. In Applicant's claimed invention, any object in the path of the light will be detected as shown in Figure 1.

Applicant respectfully submits that the Examiner has not shown that there is a colony found at column 5, lines 24 - 64 of King. A review of this portion shows that the culture is for a short period of time and then subjected to staining in order to provide the fluorescence detection. This is not a creation of a colony of the colony type culture found in Brocklehurst '003. Still further, the word "colony" does not appear in the cited lines.

Next, the Examiner asserts that King teaches pouring of a microorganism colony culture into a transparent container, citing column 6, lines 10 - 14. Applicant respectfully submits that the cited lines teach that the microorganism sample is subjected to fluorescent staining and placed on a slide, then placed in the specimen cassette assembly which is then placed on a platform. This does not support the Examiner's interpretation of the cited language.

Next, the Examiner states that column 6, lines 31 - 36 support the contention that there is a coherent laser beam

illuminating the container cell. However, the purpose of the illumination is not for the claimed receiving of light projection by the colony, or the claimed illumination of the object placed on the loading portion in combination with light sensitive array detectors which receive light projection generated by said object illuminated (claims 2 and 3). Instead, the LED illumination of '396 is used to initiate the fluorescence which is then the image which is detected (see column 6, lines 35 - 40). Next the Examiner asserts that there is a receipt of light projection generated by the medium with an image sensor citing column 6, line 31 - column 7, line 17. Applicant respectfully submits that this is not light projection as claimed. The light as claimed is in passing the light received by the colony and analyzing an image of it. On the other hand, in '003, there is no such projection generated by the medium. The medium instead creates fluorescence which is simply not a projection of the light of the laser beam as claimed.

Next, the Examiner asserts that there is a teaching of detecting of colonies large enough to create shades and block the laser beam. This is incorrect. What is detected in '396 is the fluorescence, not the laser beam. Therefore, since only fluorescence is detected, there cannot be a blocking of the laser beam to produce projected image data of colonies on an image sensor as Applicant claims.

Brocklehurst is cited as a teaching of placement of a colony culture into a transparent cell. It is not understood why such a

citation would be necessary if the Examiner is correct in asserting that King teaches a colony in the first instance. However, Brocklehurst fails to teach the concept of creating the claimed projected images set forth in Applicant's claims. As explained above, Brocklehurst in Figure 2 shows and relies upon scattered light which passes from the sample to a lens (10) (at a 90° angle) to the beam which passes straight through and reaches a beam stop (15). This scattered angle analysis does not utilize the shades and images claimed by Applicant.

Next, with respect to claim 2, the Examiner argues that King and Brocklehurst are combinable because they are both concerned with optically detecting the presence of colonies. Applicant respectfully submits that King is not concerned with colonies and never mentions colonies in its entire specification. Still further, King, as pointed out above, teaches directly away from the detection of colony art in column 1, lines 20 - 33. King simply does not want to wait for cultures which might take from 48 to 72 hours to grow. On the other hand, '003 is related to bacterial colonies and monitoring by regular measurement of light scattered from the colonies (see column 10, lines 25 - 35).

The Examiner asserts that there is a suggestion or motivation for combining King and Brocklehurst while the references (King) teach away from each other. Therefore, Applicant respectfully submits that it would not be obvious to combine King and Brocklehurst who uses a colony which King teaches against.

With respect to claim 11, the Examiner cites column 9, lines 15 - 65 of King for support that there is a detection of presence of microorganisms before colonies overlap. Initially, the Examiner should note that in King the projection is not detected, Instead, it is the fluorescence. Next, at column 9, lines 25 - 40, King teaches that his invention is superior to colony culture because it allows a substance to be tested and conclusion reached in a very small fraction of the time currently spent waiting for cultures to mature sufficiently to reach final determination by methods and apparatuses of the prior art (King, column 9, lines 35 - 40). Applicant's claim 11 depends from claim 2 which requires receipt of light projection generated from the colony culture with an image sensor (Step (e)) and the detection of the presence and analyzing after the colonies grow to create shades and block the laser beam (Step (f)). This is what is taught away from in column 9. Finally, it should be noted that column 9 makes no mention of overlap of fluorescent samples which are coated onto medium film at intervals.

With respect to claim 12, the Examiner asserts that column 9, lines 15 - 45 of King relates to detecting a number of colonies to express a level of contamination in a food stuff as claimed. Column 9 uses the term "projections", in the sense that it is projecting a number based upon an initial count. This is not projections as referred to in Applicant's claims which relates to the projected image. Next, '396 depends upon the detection of level of fluorescence, not a step of detecting a

number of colonies to express a level of contamination as claimed by Applicant.

With respect to claim 13, the Examiner relies upon official notice that image detectors having an area greater than one micron in size were well known in the art. Applicant respectfully requests the Examiner to note that claim 13 relates to the size of the colony which produces an image output data on a detector having an area greater than one micron is size. This relates the detector size to the colony size. The Examiner has not shown in this rejection that colonies of the cited prior art would cast such a shade for blockage of the laser beam projected image data of the colonies (see claim 13 which is dependent from the above quoted information from claim 2). The Examiner's rejection has failed to note the relationship between the detector size (one micron) and the claimed image data.

With respect to claim 15, the Examiner argues that staining would produce a clear image without any showing in the prior art that such staining is used for this purpose. It is respectfully submitted that teachings are required. On the other hand, '396 does use staining, but it is fluorescent staining which is for a very different purpose and it cannot be used to provide such a suggestion. In Brocklehurst '003 there is never any suggestion of a reason for or a need to stain because the data obtained is scatter data as shown in Figure 2. The scattering is produced when the narrow laser beam (passing through pinhole (2)) strikes

the sample and scatters at 90°. There is no need for staining in this situation at all.

It is only in Applicant's claimed invention, where shading and blockage are claimed, that staining becomes irrelevant.

Claims 3 - 4

These claims are rejected over the combination of King, Brocklehurst and Drocourt. Drocourt is additionally cited for the inclusion of a beam expander in the combination of King and Brocklehurst. However, this does not comport with the teaching of Brocklehurst which uses a narrow beam, not an expanded beam. Brocklehurst in Figure 2 teaches a pinhole (9) to narrow the laser (8) before it strikes the plate to be inspected. Therefore, it is impossible to combine these two references because they simply operate on different principles. Still further, King while utilizing a laser or conventional light from source (20) and a lens (26), fails to provide the claimed illumination system which projects the laser beam onto an image sensor. Instead the video camera (31) of King is for sensing the fluorescence, not the claimed projection from a beam expander. Instead, '396 excites the fluorescence from source (20), (26) and it is the fluorescence which is detected, not the light projection as claimed in claim 3. Drocourt '394, as shown in Figure 3, utilizes a beam dump as does Brocklehurst '003 and a scanning system using scanning mirrors (16) and (17) and a membrane holder (18). It is the scanning device (10) which

utilizes coherent light to scan a solid support (11) represented by a filter membrane carried on a membrane support (8). The solid support (11) is where the sample to be analyzed is deposited (column 10, lines 40 - 45). When the scanner (16) focuses laser on the target (11), fluorescence from the microorganisms is thereby induced (column 10, lines 62 - 65). It is the fluorescent light which is omitted from the specimen membrane and passes through dichroic filters (20) and optical filters (21) to the photomultipliers (30). As shown in Figure 3, the photomultiplier tubes (30) are detecting the light shown in Figure 3 in dashed lines. This is fluorescent light, not the claimed light projection generated by the colony culture and image data obtained after colonies grow large enough to create shades and the colonies block the laser beam to produce projected image data of the colonies on the image sensor. Instead, it is fluorescence information which is received by the image sensor, not projected image data as claimed.

With respect to claim 4, Applicant notes that claim 4 requires that the coherent laser beam illuminate through transparent nonflowing cell containers and that the image sensor be an array of light sensitive detectors arranged to receive the compounded light projection generated by the transparent nonflowing cell containers which provide projected image data. This is simply not the case with King which utilizes a fluorescent system and does not rely upon the claimed projection.

Next, King and Drocourt are not combinable for the reasons stated with respect to claim 3 immediately above.

Claim 5

The rejection of claim 5 is respectfully traversed on the grounds that Hirschfeld is a flowing cell system for a single cell nucleus. Hirschfeld is simply not related to the colony culture art of Brocklehurst or Olsztyn, or the fluorescent art of King and Drocourt. There is no teaching or suggestion in Hirschfeld of any possibility of use with the other four references. Still further, the other four references are not even compatible in that one group relates to colonies (Brocklehurst and Olsztyn) while the other group relates to fluorescents (King and Drocourt). The Examiner's contention that the references are combinable because they are from the imaging systems art for detecting microscopic objects does not support this rejection. There must be more, namely , teachings and suggestions within the art relied upon by the Examiner which would lead one of ordinary skill in the art to combine the references to arrive at Applicant's claimed invention. The Examiner also argues that there would be enhancing of imaging effects, but fails to explain why the system taught by Hirschfeld for single cell nuclei in flowcells would have any effect at all upon the systems taught in the other four references.

Claim 6

Claim 6 has been amended to state that the colony is under observation and that the loading portion rotates when the object with constant angular velocity around the center passes through the center of the object during measurement. This defines over the statement found in Olsztyn, column 6, lines 31 - 40 where the rotation is not for observation, but for sprinkling or dropping the bacteria specimen onto the dish prior to measurement.

It should be noted that claim 6 is dependent from claim 3 and is also patentable for the reasons previously stated with respect to claim 3.

Still further, the Examiner is rejecting claim 6 on the combination of King, Brocklehurst, Drocourt and Olsztyn. Applicant respectfully submits that these four references when taken in combination simply do not suggest the combination set forth in claim 6 which is that the coherent laser beam illuminate in a direction perpendicular to the axis of rotation and that there be light projection generated by the object, and yet further including the claimed beam expander found in claim 3.

Claims 8 - 10 and 14

Claim 8 has been rejected on the grounds that cylindrical cells are well known in the art. However, the Examiner does not find a teaching or suggestion of such cylindrical cells as claimed wherein the light passes through the cylindrical cell and strikes the sensor in a manner shown in Figure 1, or as set forth in claim 2.

In claim 9, the Examiner has relied upon the rejection previously set forth in claim 6. Claim 9 has not been amended as was claim 6. Claim 9 required that there be a step of rotating the container so at constant angular velocity around a center axis that passes through center of the object. Claim 9, depends from claim 8, which depends from claim 2. In claim 2 it was stated that the container cell be illuminated with a coherent laser beam. This is not suggested in Olsztyn column 6, line 31 - 40, where there is no illumination, but instead mere rotating while bacteria specimen are dropped onto a dish.

In claim 10, the Examiner has also based the rejection on Olsztyn and the citation of rotation about an axis passing through the center of a container cell when illuminated by a laser beam. However, column 6, lines 31 - 40 and column 3, lines 10 - 50 of Olsztyn do not support this contention. In column 6, lines 31 - 40, there is no laser beam passing through during rotation. On the other hand, in column 3, lines 10 - 50 thee is linear movement, not rotary movement. It is, therefore, concluded that the references neither suggest nor render obvious claim 10 which rotates a container cell about an axis that passes through a center of the cell when illuminated by the laser beam. In this case, not even all elements can be claimed to be found in the combination of many references.

In the rejection of claim 14, the Examiner predicates the rejection on an observation that features were exceedingly well known in the art citing Olsztyn. In Olsztyn, the colonies are

not a colony culture mixture in a transparent cell, but instead, are a colony culture on a surface (column 6, lines 31 - 40).

Olsztyn simply does not suggest or teach a combination with King and Brocklehurst to achieve the result of claim 14 which is dependent from claim 2.

Claim 16

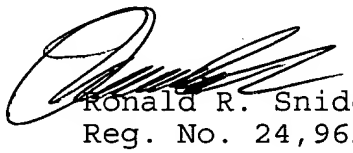
Claim 16 has been further rejected over King, Brocklehurst, Drocourt in view of Tanaka. Tanaka teaches a beam expander, while Brocklehurst teaches away from a beam expander because of the pinhole (9). The references operate differently and teach away from each other because one cannot merely substitute a beam expander in place of the laser (8) and pinhole (9) of '003 and arrive at any operative device which is useful for the detection system of '003 which necessarily depends upon a narrow beam in order to produce a scatter at 90°. Applicant respectfully submits that the references when taken together do not teach or suggest Applicant's invention, because they are not combinable as the Examiner would assert.

While Tanaka may teach a beam expander, Tanaka teaches only the presence of beam expanders in the optical art. Tanaka does not suggest the use of a beam expander as claimed in the context of claim 16 which depends upon claim 3.

In view of the foregoing, it is respectfully submitted that the application is now in condition for allowance, and early

action in accordance thereof is requested. In the event there is any reason why the application cannot be allowed in this current condition, it is respectfully requested that the Examiner contact the undersigned at the number listed below to resolve any problems by Interview or Examiner's Amendment.

Respectfully submitted,



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